

coincides with the common Alleghanian plant. No stolons of the Asiatic plant have been examined but so accurately does it coincide with our plant in all the other crucial points that there can be hardly a question of their identity. The Asiatic species which seems clearly to agree with ours is *C. quadrisulcata* (Maxim.) Franchet & Savatier,<sup>1</sup> based upon *C. lutetiana*, var. *quadrisulcata* Maximowicz,<sup>2</sup> a plant originally described from Amur and distinguished by its 4-sulcate fruit, its glabrous stem, and its lance-ovate leaves. The identification of this plant of eastern Asia with our Alleghanian woodland species is interesting as adding still another to the large group of genera and species — *Caulophyllum*, *Podophyllum*, *Liriodendron*, *Polygonum virginianum*, etc.— which are common to these two isolated areas.

GRAY HERBARIUM.

## WEED GROWTH AND UNUSUAL RAINFALL.

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THE unusual rainfall throughout the central and northeastern states during the summer just past has greatly influenced most kinds of vegetation. In the course of a long-continued, hand to hand contest with weeds in a garden of moderate size the writer was led to note some differences between the relative abundance and luxuriance of growth of certain weeds this year and in ordinary summers. The rainfall in and near Boston during July of this summer (1915), 8.85 inches, has been equaled only twice in 98 years, the July average for that whole period being about 3.57 inches.<sup>3</sup> The August rainfall this summer is 5.63 inches, while the 98-year average for the month is about 4.01 inches, making the rainfall for the two months almost double the usual amount. Farther away from the coast the precipitation has in many localities been much in excess of the values for Boston just cited.

<sup>1</sup> Franch. & Sav. Enum. Pl. Jap. i. 169 (1875).

<sup>2</sup> Maxim. Prim. Fl. Amur. 106 (1859).

<sup>3</sup> 1818–1870 observations at Roxbury; 1871–1915 observations of U. S. Weather Bureau in Boston.



Herbaceous vegetation in general has grown more vigorously than usual in consequence of the abundant water supply. A few examples from a grassy vacant lot in Cambridge, with very poor sandy soil, may suffice to illustrate this. *Ambrosia artemisiifolia* showed plenty of specimens growing to a height of 1.5 metres; *Oenothera biennis* reached a height of 1.72 metres; *Erechtites hieracifolia* (a moisture-loving plant which does not usually grow at all in this bit of ground) was 2.0 metres high. *Helianthus grosseserratus*, growing in tough sod near by, reached a height of 3.3 metres. The annual weeds of the field and garden are perhaps rather more sensitive in their responses to variations in their environment than most seed plants. Competition is especially sharp among these species and they have no such monopoly of their seed beds as do many plants which grow in uncultivated soil. Most of the species which the agriculturist reckons as weeds are mesophytes, but the range in water requirement between such a plant as the ox eye daisy, *Chrysanthemum Leucanthemum*, var. *pinnatifidum* and such a one as the great ragweed, *Ambrosia trifida*, is rather wide.

For convenience some of the common weeds of New England in regard to which the writer has been able to obtain notes this summer may be arranged in three groups:

1. Those which are decidedly more vigorous than usual.
2. Those which show little difference in growth from that of ordinary seasons.
3. Those which are relatively less important than in ordinary seasons.

Prominent among the first group are the coarse annual grasses, finger grass, *Digitaria humifusa*, crab grass, *Digitaria sanguinalis*, barn yard grass, *Echinochloa crusgalli*, and old witch grass, *Panicum capillare*. These are all shallow-rooted species, with large and probably actively transpiring leaf surfaces. The only common representative of *Cyperaceae* is the rather abundant, very variable, tuber-bearing *Cyperus strigosus*. Other weeds much in evidence this season are lady's thumb, *Polygonum Persicaria*, horseweed, *Erigeron canadensis*, ragweed, *Ambrosia artemisiifolia*, and beggar ticks, *Bidens frondosa*. All these weeds, though they are troublesome in ordinary soils and every year, flourish best when they can get an abundant supply of moisture.

The weeds which the writer has found to be not much more conspicuous and annoying this year than usual are many of them among the



most pestilent to be found in New England fields and gardens. Prominent among these are couch grass, *Agropyron repens*, green foxtail, *Setaria viridis*, common sorrel, *Rumex Acetosella*, pigweed, *Chenopodium album*, rough pigweed, *Amaranthus retroflexus*, and lady's sorrel, *Oxalis corniculata*. The *Agropyron* roots deeply and can always secure water, even from rather dry soils, through its wide-ranging, many-rooted rhizomes. The *Rumex* has an exceedingly extensive and intricate root system. It is not so easy to explain why the other four species named in this group seem to be so little affected by the presence, or absence of an abundant water supply.

The only weeds which have seemed to me relatively less important this season than usual are carpet weed, *Mollugo verticillata* and purslane, *Portulaca oleracea*. Both are xerophytes, as is evident from the way in which they tolerate extreme drought conditions, the former growing on very dry sand dunes, the latter a common weed in some of the driest parts of eastern Kansas and capable in ordinary climates of growing long after it has been uprooted and left lying on the surface of the soil. The seeds of purslane, according to Professor G. E. Stone of the Massachusetts Agricultural college, are exceptional in their power to grow in very dry soil, germinating in earth containing only 0.5 per cent of moisture. It would not be easy to show marked xerophytic features in the form or the structure of *Mollugo*, but *P. oleracea* is decidedly succulent and is the most familiar plant of this type throughout a large portion of the central and the northeastern states.

Doubtless other observers may in many cases have found different weed species predominant this year from those that have come under my own notice. Professor M. A. Chrysler of the University of Maine, at Orono, Maine, reports the July rainfall this year as 6.67 inches, while the average rainfall for the month is 3.22 inches. He does not report any weeds as having been unusually common. Mr. H. E. Downer reports from the botanic garden of Smith College, at Northampton Mass., that almost all weeds are more troublesome than usual this season and names *Digitaria sanguinalis*, *Mollugo verticillata*, *Portulaca oleracea*, *Oxalis corniculata*, *Acalypha virginica*, *Convolvulus arvensis*, and *Ambrosia artemisiifolia* as particularly abundant.

Weeds of lawns and grass lands, as a rule, have shown less response to the stimulus of an unusual rainfall than have many of the denizens of tilled ground. This may be partly because the grasses among



which they grow have taken up much of the water. But other reasons, in the cases of such deep-rooted composites as *Taraxacum*, *Cichorium*, and *Leontodon* may be found in the facts that their roots reach well down into the soil after water and that their latex supply appears to hinder excessive transpiration, so that they are more independent of an abundant water supply than are most leafy, non-succulent plants.

Along the borders of sidewalks and in the stone-paved gutters of Cambridge streets there is found a limited flora, consisting largely of small and somewhat xerophytic plants, among which are a few grasses, such as *Eragrostis capillaris*, *Eragrostis Frankii*, *Poa annua*, and a few other species, which do not usually either flower or fruit. Other plants of frequent occurrence are, *Polygonum aviculare*, *Mollugo vericillata*, *Spergularia rubra*, *Euphorbia maculata*, *Euphorbia humistrata*, and *Gnaphalium uliginosum*, all small-leaved plants of little capacity for transpiration. Depauperate specimens of *Plantago Rugelii* are also abundant. The members of this sidewalk flora are for the most part no more conspicuous than usual this summer, though perhaps the grasses have fruited more successfully than they generally do.

Summing up my own observations in the briefest terms, it may be said that many of our annual weeds and ruderal plants have profited greatly by the unusual water supply which they have received this summer and that in general, but not always, more than ordinary luxuriance has characterized those species which would *a priori* have been classed as large consumers of soil water.

#### CAMBRIDGE, MASSACHUSETTS.

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EXTENSIONS OF RANGE.— During a visit to Monhegan Island on the coast of Maine in the summer of 1911 the writer noticed, while hurrying from "Cathedral Woods" to the wharf to catch the boat to Boothbay, a few specimens of *Carex crinita* which had an unusual appearance. These were hastily gathered and upon later study proved to be *C. crinita*, var. *Porteri* (Olney) Fernald. It was not possible to return for further collections, so no information is at hand as to the distribution or abundance of this rare variety on Monhegan. Its mere occurrence on this oceanic island, lying isolated, twenty miles from the mainland, is sufficiently remarkable and interesting. The variety is based upon specimens collected by Dr. Thomas C. Porter,